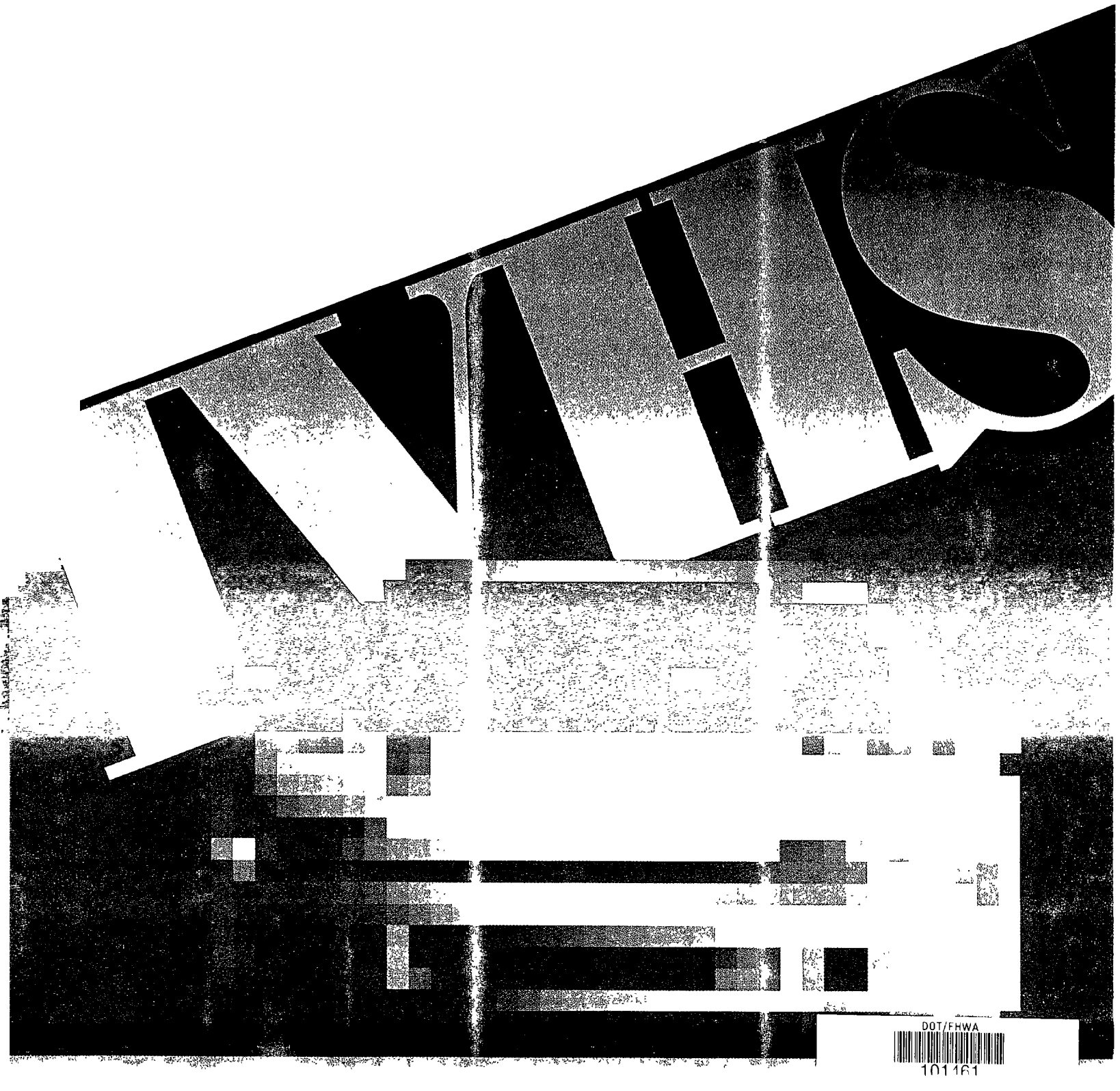
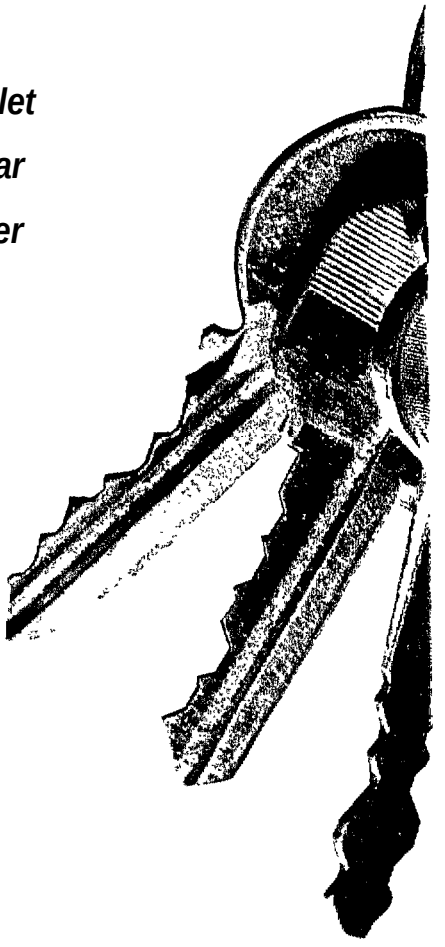
NTELLIGENT

VEHICLE HIGHWAY SYSTEMS

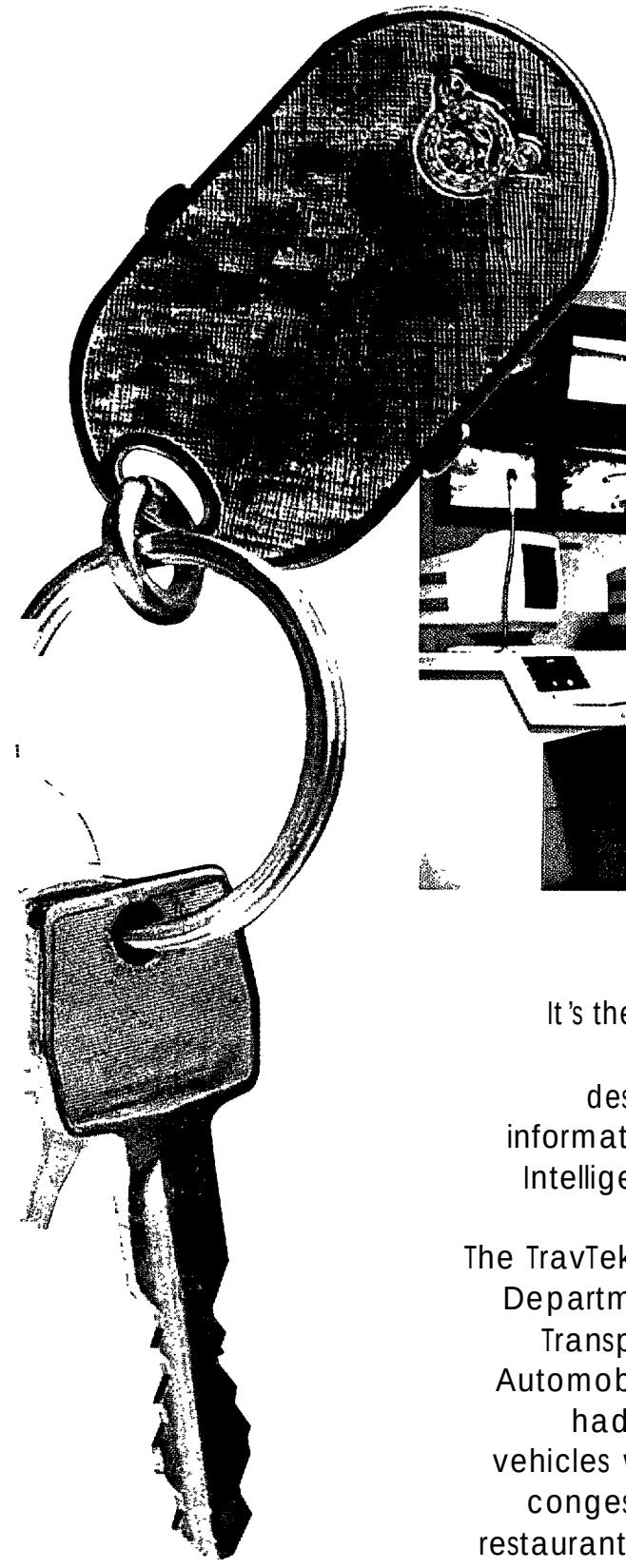
U.S. Department
of Transportation



It's vacation time. You've just arrived at your destination and you're ready for a week of test and relaxation. You've been planning this trip for months. You know all the places you want to visit and all the attractions you want to see. This year you've even made certain you won't get lost driving around a strange city. Your rental car is equipped with a computer map, digital voice, and a cellular telephone. The map can guide you to your destination, the digital voice will let you know when to turn, and the cellular telephone will connect you to a traveler services center.



Advanced Technology for Safer, Easier Travel

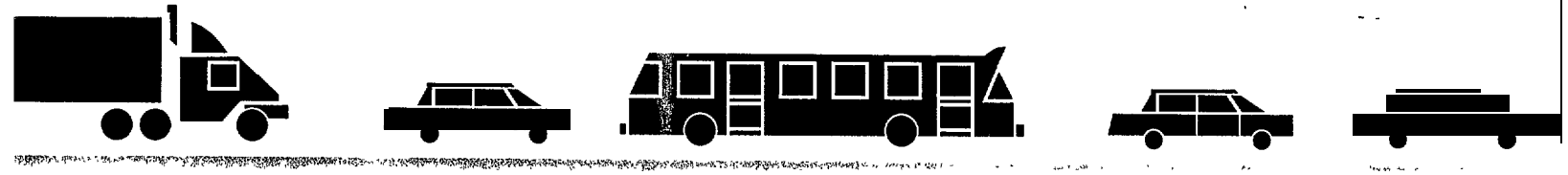


Traffic management centers will monitor traffic, adjust traffic signals, and provide up-to-the-minute traffic information to travelers as well as transit and truck operators.

Washington State Department of Transportation

It's the year 2001, right? Wrong. The year was 1992 and the place was Orlando, Florida. The innovation just described was TravTek, one of the many traveler information services now being considered under the Intelligent Vehicle Highway Systems (IVHS) program.

The TravTek test involved the city of Orlando, the Florida Department of Transportation, the U.S. Department of Transportation, General Motors, and the American Automobile Association. Anyone who visited Orlando had the opportunity to rent one of the 75 TravTek vehicles which provided information on routing, traffic congestion, and traveler services such as hotels and restaurants. TravTek testing has successfully concluded, and serves as a hint of things to come.



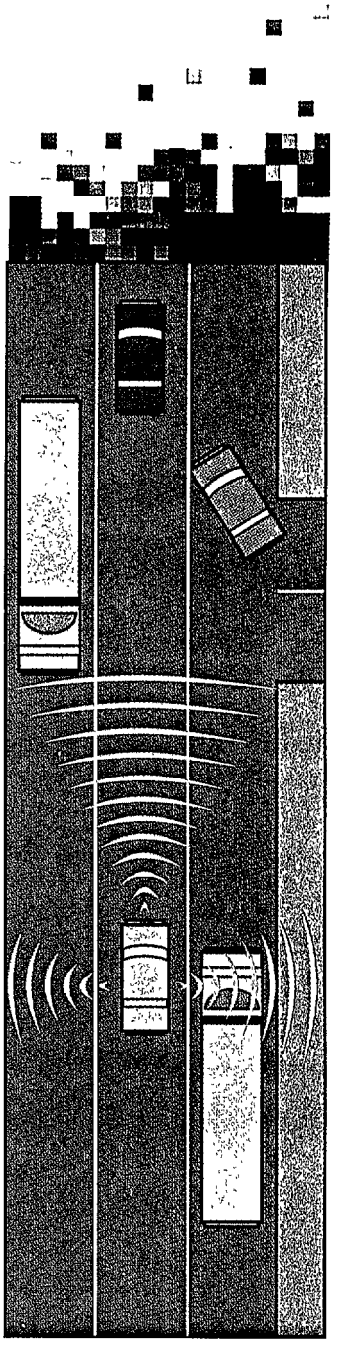
VISION

Safer, Better Informed Travelers

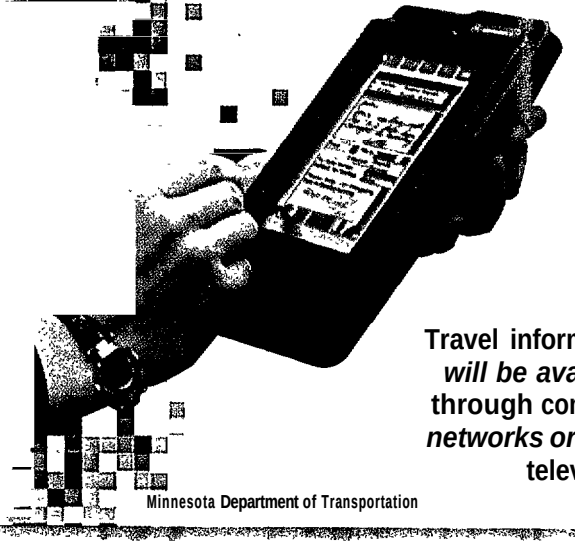
The national IVHS program identifies, analyzes, tests, and implements new and existing technologies and services to move the Nation's transportation system beyond the Interstate highway era. Not only is this program designed to improve the quality and range of transportation choices in the United States, but also to achieve this mission through safer, better informed travelers.

Congestion and highway accidents are two major forces behind the IVHS program. To reduce the high costs in lives, injuries, property damage, and time, the IVHS program is being expedited. These efforts are reflected by the array of projects currently underway or planned.

To follow up on TravTek, a public-private partnership project called ADVANCE is being conducted in Chicago. Volunteers will test a computer route guidance and traffic information system installed in their cars. In Delaware, a test of an automated system for collecting bus fares using ATM-style cards is planned. Idaho is testing a Storm Warning System to measure environmental conditions as they affect drivers at low visibility sites on Interstate 84. Colorado is testing a system that sends warning messages to inform truck drivers of safe operating speeds on long downgrades.

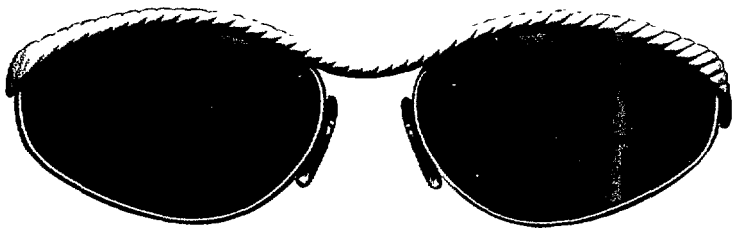


Collision *avoidance* technologies *will* reduce the *number* of accidents on *our roads.*



Travel information *will be available* through computer *networks or cable* television.

Minnesota Department of Transportation



SO WHAT CAN YOU EXPECT FROM IVHS?

Here are a few of the technologies and services being developed under IVHS that may one day be as common as the traffic light.

■ Up-to-the-minute information on bus arrivals, through cable TV in the home, kiosks in the workplace, and electronic messages at the bus stop.

■ Systems that alert authorities about the need for emergency vehicles at an accident site. These "automatic" alert systems are particularly valuable in rural areas where other forms of communication may not be readily available.

- Affordable and easy to use on-board navigation systems. Improvements will result from user responses collected during the ADVANCE and TravTek test projects.

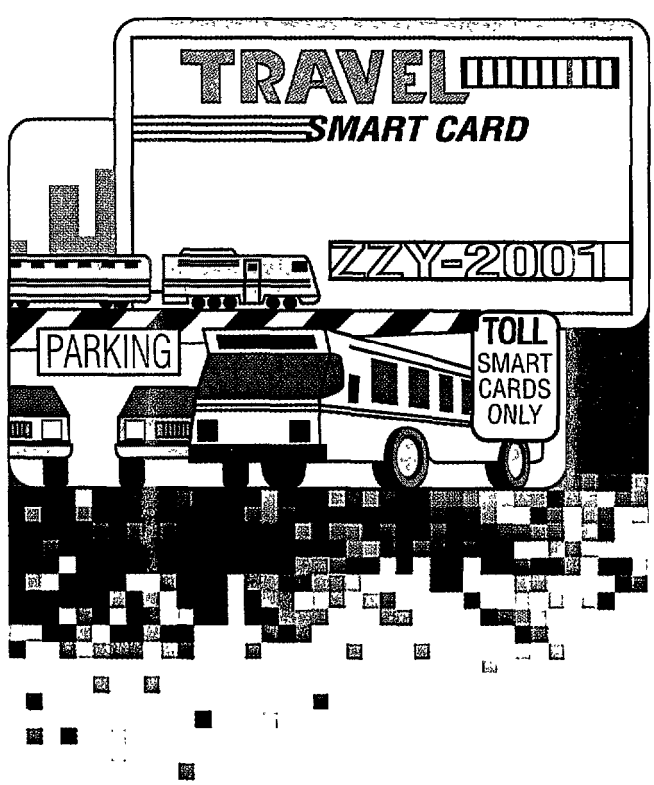
■ Electronic collection of tolls, transit fares, and other transportation user fees.

- Traffic management centers that monitor current conditions and adjust speed limits, traffic signals, and roadway ramp access based on actual traffic conditions.

■ Electronic fleet management systems that permit freight, emergency vehicles, transit, and other transporters to track their vehicles and to communicate directly with their drivers.

■ Electronic weighing and inspection of commercial vehicles while in motion, issuance and monitoring of transportation permits electronically, and tracking of containers through multi-modal (for example, from truck to rail) shipment.

■ A variety of innovations within and outside the vehicle to supplement the driver's control, including new products that ensure a motorist is fit to drive (by monitoring fatigue, for example); provide on-board road signing and vision enhancements; augment driver perception to warn of vehicles in a blind spot and unsafe headway; activate driver collision avoidance systems when necessary, and intervene with control of the vehicle if a crash is imminent; and, over time, automate the driving process on specially equipped roads.



The *smart card* will allow travelers to *use one card* to pay *for* different transportation *systems* like tolls, buses, parking, *and* rail transit.

FROM RESEARCH TO IMPLEMENTATION THROUGH PUBLIC/PRIVATE PARTNERSHIPS

The development and implementation of useful technologies require a concentrated effort and commitment from many diverse groups.

■ The Federal Government

is providing a national perspective and emphasis on safety, congestion relief, enhanced mobility, environmental impact, energy conservation, productivity improvements, and system standards. It is also providing leadership, funding research, and participating with the private sector in testing and evaluating technology.

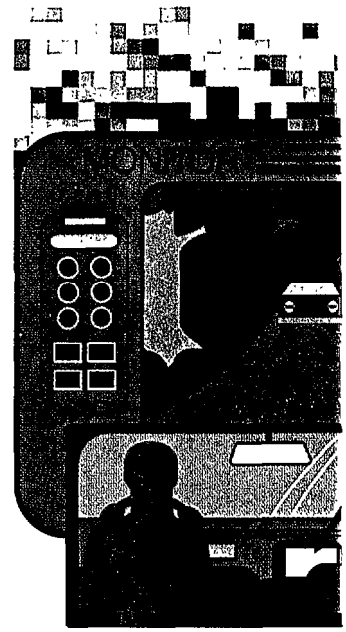
■ The Private Sector

is pursuing the development of products and services that have commercial potential and will essentially bring IVHS to reality. This group may also assume an increasing role in providing and operating infrastructure components like toll roads.

■ State and Local Governments

are selecting IVHS technologies and services for their facilities and installing, operating, and maintaining these systems.

IVHS technologies will provide vision enhancement

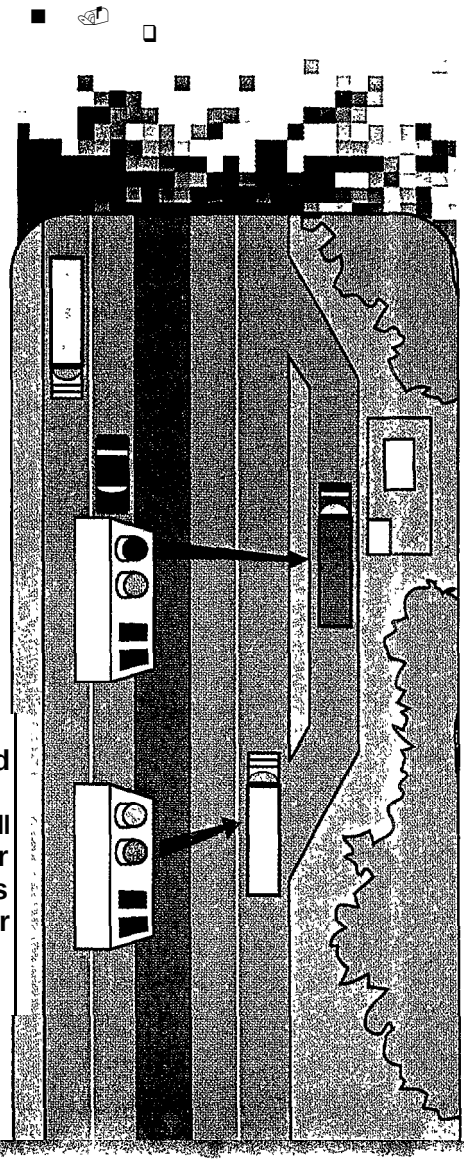


■ Universities

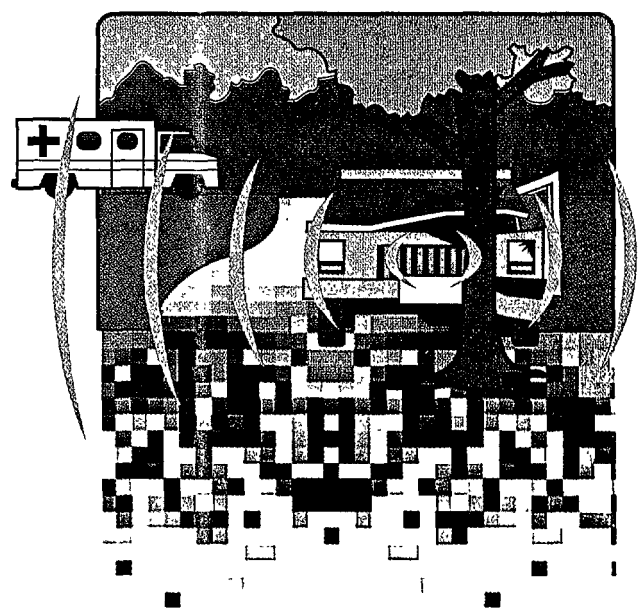
are training the next generation of transportation professionals and providing research, development, technology assessments, and operational testing.

· Consumer and Industry Groups

are offering input into the IVHS program, particularly



Computer and communications technologies will allow motor carrier operators fo bypass weigh stations or points-of-entry without stopping.



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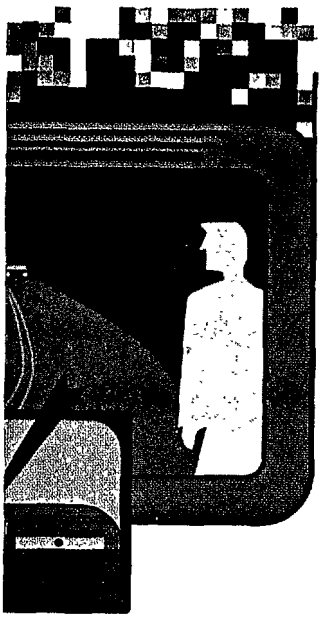
during nighttime and inclement weather.

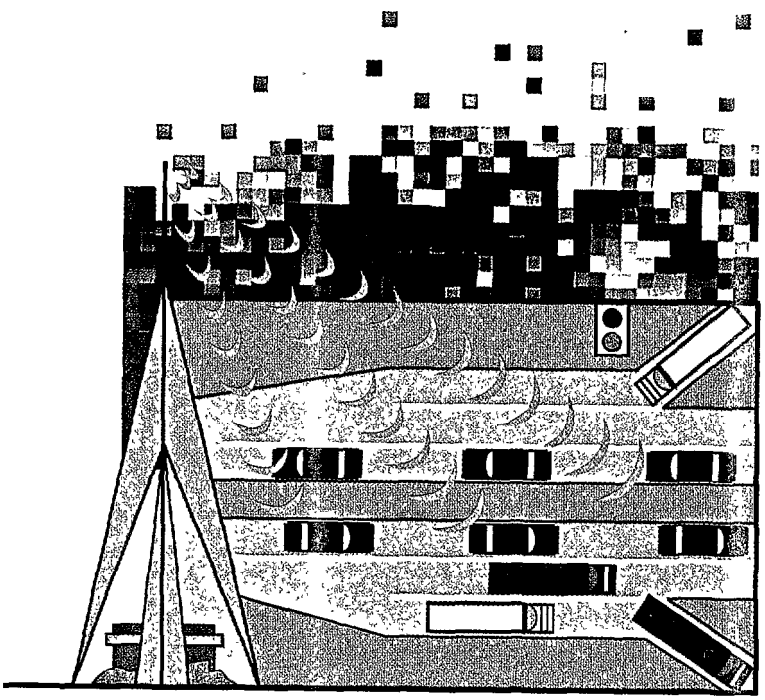


in the areas of safety, environment, and commercial viability.

All these groups are reflected in the membership of IVHS AMERICA, which serves as an educational and scientific society and is also chartered to advise the U.S. Department of Transportation on the notional IVHS program.

A LONG-TERM COMMITMENT

The U.S. Department of Transportation believes that the IVHS program is important because it will significantly improve national mobility, safety, and economic productivity. Decisions that are made about IVHS today will have major implications for our Nation's economic growth and competitiveness tomorrow. We must move IVHS forward aggressively to take advantage of the momentum we already have to ensure that the United States can compete effectively in the marketplace of the 21 st century.



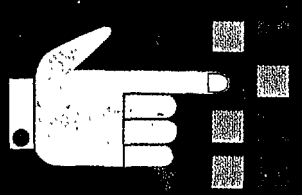
When accidents occur, Crash sensors and other vehicle devices will automatically alert emergency dispatch services

Eventually, *IVHS* technology *may allow* vehicles to travel *in* designated *lanes without* requiring *any steering by the driver.*

Conclusion

"The IVHS program presents an exciting opportunity for our country. Through the deployment of IVHS technology, we have a chance to create a surface transportation system for the 21st century—one that remains the best in the world."

Secretary of Transportation Federico Peña



So you want an easier commute?

Imagine the convenience of receiving an up-to-the-minute bus schedule on your TV or at the bus stop. The schedule will be automatically updated as the bus travels from stop to stop. Longer trips will be made easier by a computer-generated, personalized itinerary for any requested trip, showing exactly where and when to transfer.

Automobile commuters will get relief, too. Kiosks in office buildings will list information about ride sharing, traffic conditions, and commuter buses. Electronic maps in cars will inform you about areas of slow moving traffic and offer alternate routes to avoid congestion. While you commute, you'll travel more securely knowing your collision avoidance system will help avert any pending danger.

While these scenarios may sound far-fetched, they're not. These transportation conveniences are just around the bend—courtesy of IVHS.

IVHS. It's Just Around the Bend

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